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10/759,582	01/16/2004	John Thomas Mariner	US 131067-2 60QZ	7994
36580	7590	12/30/2005	EXAMINER	
GE SPECIALITY MATER ONE PLASTICS AVENUE PITTSFIELD, MA 01201			FIORITO, JAMES	
			ART UNIT	PAPER NUMBER
			1763	
DATE MAILED: 12/30/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.



# Office Action Summary

Application No.

10/759,582

Applicant(s)

MARINER ET AL.

Examiner

James A. Fiorito

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 18-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/16/04 10/4/04
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_



## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of Species 1 in the reply filed on October 27, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's election with traverse of the subspecies nitride in the reply filed on October 27, 2005 is acknowledged. The traversal is on the ground(s) that previous patents use Markush subspecies. This is not found persuasive because the manner in which previous patents were examined is irrelevant to this application. The application is examined according to the MPEP and not with regard to previous examinations of other patents. The requirement is still deemed proper and is therefore made FINAL.

Claims 18-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 27, 2005.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:



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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-5,7-9, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Masuda (US 2003/0107865).**

*With respect to Claim 1:* Masuda discloses a wafer processing device comprising: a platform for supporting an object to be heated, the platform comprises a substrate having upper and lower relatively flat surfaces, the platform is comprised of graphite (Fig. 1 Item 5, Paragraph 36); a shaft extending substantially transverse to the platform (Fig. 4 Item 11), the shaft is comprised of graphite (Paragraph 76 Lines 1-12); a first coating on at least one of the flat surfaces (Fig. 1 Item 2), with said first coating Fig. 1 Item 2) composed of a nitride (Paragraph 36 Lines 2-6 and Paragraph 5); a second coating (Figure 1 Item 3) layer composed of pyrolytic graphite (Paragraph 36 Lines 2-6) disposed on the first coating in a patterned arrangement of predetermined geometry (Fig. 1 Item 4, Paragraph 5), the layer having at least two separate ends adapted for forming at least an electrode (Fig. 1 Item 3, Paragraph 36); and a third coating (Fig. 1 Item 4) of a dielectric material superimposed on said first and second coatings (Fig. 1 Item 4), the third coating is composed of a nitride (Paragraph 42 and 5).

*With respect to Claim 2:* Masuda discloses the device is an electrostatic chuck and the electrode is a chuck electrode (Paragraph 6).



*With respect to Claim 3:* Masuda discloses the device is a heater and the electrode is a heating element electrode (Paragraph 6).

*With respect to Claim 4:* Masuda discloses the graphite platform is one of a disk, platen, and a cylinder (Fig. 1, Paragraph 36).

*With respect to Claim 5:* Masuda discloses the graphite shaft is one of a rod and a hollow core (Fig. 4 Item 11).

*With respect to Claim 7:* Masuda discloses the patterned second coating is formed on said lower surface of said platform (Fig. 1 Item 3).

*With respect to Claim 8:* Masuda discloses the said pyrolytic graphite second coating layer is encapsulated in a nitride (Fig. 1 Item 4, Paragraph 5).

*With respect to Claim 9:* Masuda discloses the said pyrolytic graphite second coating layer is encapsulated in pyrolytic boron nitride (Fig. 1 Item 4, Paragraph 42 Lines 1-5).

*With respect to Claim 11:* Masuda discloses the graphite shaft further inherently includes at least two electrical conductors for connecting the electrode to an external source of power (Fig. 5 Item 11), since the electrode needs to be connected to an external power supply through the shaft for the device to function according to how it is presented in Fig. 5.

***Claim Rejections - 35 USC § 103***



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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda (US 2003/0107865) in view of Nishikawa (US 6,213,478).**

*With respect to Claim 10:* Masuda discloses a wafer processing device according to claim 1 as shown above.

Masuda does not expressly state that the graphite shaft and the graphite platform form a single unitary body.

Nishikawa discloses a shaft and a platform that form a single unitary body (Fig. 1 Items 110 and 107, Column 1 Lines 23-25). Masuda and Nishikawa are analogous art because they are from the same field of endeavor namely wafer processing devices.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the device of Masuda including the graphite shaft and the graphite platform forming a single unitary body in view of the teaching of Nishikawa. The suggestion or motivation for doing so would have been to form a substrate support that could be placed in the slip-fit bore of a spindle (Column 1 Lines 23-25). This would have provided the benefit of having both a removable and rotatable substrate support electrode. Therefore, it would have been obvious to combine Masuda with Nishikawa to obtain the invention specified in claim 10.



**Claims 12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda (US 2003/0107865) in view of Komino (US 5,478,429).**

*With respect to Claim 12:* Masuda discloses a wafer processing device according to claim 11 as shown above.

Masuda does not expressly state that the two electrical conductors are concentric with the first electrical conductor being disposed within the second electrical conductor.

Komino discloses two electrical conductors, which are concentric with the first electrical conductor being disposed within the second electrical conductor (Fig 1 Items 14 and 15, Column 1 Lines 43-47). Masuda and Komino are analogous art because they are from the same field of endeavor namely wafer processing devices.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the device of Masuda including the two electrical conductors being concentric with the first electrical conductor being disposed within the second electrical conductor in view of the teaching of Komino. The suggestion or motivation for doing so would have been to provide a means of connecting a lower electrode to an RF power supply without using a conventional coaxial cable, since coaxial cables require a cumbersome operation to connect a shielded line to a process chamber and the impedance of the apparatus may be change depending on the manner of connecting them (Column 1 Lines 28-35). Therefore, it would have been obvious to combine Masuda with Komino to obtain the invention specified in claim 12.



*With respect to Claim 15:* Masuda discloses a wafer processing device according to claim 11 as shown above, wherein said two electrical conductors are disposed within the shaft.

Masuda does not expressly state that the shaft has a hollow core, wherein the two electrical conductors are concentric.

Komino discloses a shaft that has a hollow core, wherein the two electrical conductors are concentric (Fig 1 Items 14 and 15, Column 1 Lines 43-47). Masuda and Komino are analogous art because they are from the same field of endeavor namely wafer processing devices.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the device of Masuda including the two electrical conductors are concentric with the first electrical conductor being disposed within the second electrical conductor in view of the teaching of Komino. The suggestion or motivation for doing so would have been to provide a means of connecting a lower electrode to an RF power supply without using a conventional coaxial cable, since coaxial cables require a cumbersome operation to connect a shielded line to a process chamber and the impedance of the apparatus may be change depending on the manner of connecting them (Column 1 Lines 28-35). Therefore, it would have been obvious to combine Masuda with Komino to obtain the invention specified in claim 15.

*With respect to Claim 16:* Komino discloses the two concentric electric conductors have a common center (Column 1 Lines 28-35).



**Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda (US 2003/0107865) in view of Pratap (US 5,210,452).**

*With respect to Claim 13:* Masuda discloses a wafer processing device according to claim 11 as shown above.

Masuda does not expressly state that the two electrical conductors are symmetrically disposed on opposite sides of the graphite shaft.

Pratap discloses two electrical conductors that are symmetrically disposed on opposite sides of a shaft (Fig. 3A Items 35 and 37, Column 6 Lines 67-68). Masuda and Pratap are analogous art because they are from the same field of endeavor namely power transferring devices. Both require an electrical connection to an outside power source for the devices to function.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the graphite shaft of Masuda including the two electrical conductors being symmetrically disposed on opposite sides of the graphite shaft in view of the teaching of Pratap. The suggestion or motivation for doing so would have been to provide a brush connection to the shaft, allowing the substrate support to rotate while in contact with the external power supplied to the electrode. Therefore, it would have been obvious to combine Masuda with Pratap to obtain the invention specified in claim 13.

*With respect to Claim 14:* Pratap discloses the shaft is essentially solid and said two electrical conductors are coated layers symmetrically disposed on opposite sides of the shaft (Fig. 3A Items 35 and 37).



**Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda (US 2003/0107865) in view of Kushihashi (US 2003/0217767).**

*With respect to Claim 17:* Masuda discloses a wafer processing device according to claim 11 as shown above.

Masuda does not expressly state that the said first electrical conductor is in a form of a graphite rod, the second electrical conductor is a hollow graphite rod, and wherein the first and second electrical conductors are separated by means of a coating layer comprising a material selected from the group of least a nitride, carbide, carbonitride or oxynitride of elements selected from a group consisting of B, Al, Si, Ga, refractory hard metals, transition metals, and rare earth metals, or complexes and/or combinations thereof.

Kushihashi discloses a first electrical conductor is in a form of a graphite rod (Fig. 2 Item 9 Paragraph 46), and a second electrical conductor is a hollow graphite rod (Fig. 2 Item 7 Paragraph 46), wherein the first and second electrical conductors are separated by means of a coating layer comprising the material pyrolytic boron nitride (Fig. 2 Item 8 Paragraph 46). Masuda and Kushihashi are analogous art because they are from the same field of endeavor namely high temperature process devices. Both devices are required to operate in high temperature environments.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the device of Masuda including the said first electrical conductor is in a form of a graphite rod, the second electrical conductor is a hollow graphite rod, and wherein the first and second electrical conductors are separated by means of a coating



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layer comprising a material selected from the group of least a nitride, carbide, carbonitride or oxynitride of elements selected from a group consisting of B, Al, Si, Ga, refractory hard metals, transition metals, and rare earth metals, or complexes and/or combinations thereof in view of the teaching of Kushihashi. The suggestion or motivation for doing so would have been to provide power connection to the electrode with an excellent resistance to high temperatures (Paragraph 31 Lines1-4). Therefore, it would have been obvious to combine Masuda with Kushihashi to obtain the invention specified in claim 17.

**Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda (US 2003/0107865) in view of Chu (US 6,793,767).**

*With respect to Claim 6:* Masuda discloses the second coating (Fig. 1 Item 3) is patterned to form a continuous elongated strip of pyrolytic graphite (Paragraph 36).

Masuda does not state that the strip is arranged in at least one of electrical flow path has at least one of a spiral pattern, a serpentine pattern, a helical pattern, a zigzag pattern, a continuous labyrinthine pattern, a spirally coiled pattern, a swirled pattern, a randomly convoluted pattern, and combinations thereof.

Chu discloses an electrode arranged in a spiral pattern (Column 3 Lines 10-20). Masuda and Chu are analogous art because they are from the same field of endeavor, namely semiconductor processing devices.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the pyrolytic graphite strip of Masuda including the strip being arranged in



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at least one of electrical flow path has at least one of a spiral pattern, a serpentine pattern, a helical pattern, a zigzag pattern, a continuous labyrinthine pattern, a spirally coiled pattern, a swirled pattern, a randomly convoluted pattern, and combinations thereof in view of the teaching of Chu. The suggestion or motivation for doing so would have been to provide a pattern required by Masuda in an arrangement capable of distributing the electrode evenly across the substrate while maintaining two connection leads to the power supply.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Masuda (US 6,678,143) teaches an electrostatic chuck having a coating layer surrounding an insulating layer. Kano (US 2004/0108314) teaches a heating apparatus which has electrostatic adsorption function, and a method for producing it.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Fiorito whose telephone number is (571)272-7426. The examiner can normally be reached on Standard.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James Fiorito  
Patent Examiner  
AU 1763

JF

  
Parviz Hassanzadeh  
Supervisory Patent Examiner  
AU 1763